UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PRELIMINARY DETERMINATION DOCUMENT
PREVENTION OF SIGNIFICANT AIR QUALITY DETERIORATION
PROPOSED MODIFICATION OF THE PRUDHOE BAY OIL FIELD AT PRUDHOE BAY, ALASKA

SCOPE

This document, with the technical analysis, presents EPA's preliminary determination of approvability of the Atlantic Richfield Company/SOHIO Petroleum Company (ARCO/SOHIO) proposal to modify the production facilities at the Prudhoe Bay Oil Field at Prudhoe Bay, Alaska under Title 1, Part C of the Federal Clean Air Act, "Prevention of Significant Deterioration of Air Quality" (PSD).

GENERAL INFORMATION

The Federal Clean Air Act requires review and approval of the construction or modification of major sources of air pollution to assure that the air quality in areas attaining National Ambient Air Quality Standards (NAAQS) is not deteriorated beyond allowable limits for any pollutants regulated by EPA as a result of increased emissions from such new or modified facilities.

Before an application to construct or modify a major stationary source can be approved, it must be demonstrated that the expected emissions of all regulated pollutants above the minimum level established by Section 169 of the Act will not exceed the following:

1. Emission limits achievable by the application of best available control technology (BACT).

2. National Ambient Air Quality Standards.

3. In the case of particulate matter (TSP) and sulfur dioxide (SO_2), allowable air quality increments.

FINDINGS

ARCO/Sohio proposes to install 42 gas fired combustion turbines (617 Mw total) and 31 gas fired heaters totalling

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CONCURENCES							
SYMBOL		NYE	JOHNSTON	GEREN	REED	COATE	DUBOIS	
SURNAME		RCN						
DATE		4-17-80	4/20/80	4/21	4/22			

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1,530 million BTU/hr. The Prudhoe Bay oil field expansion project will include each of these three projects: Produced Water Injection, Artificial Lift, and Low Pressure Separation. The purpose of the project is to provide additional power to increase the rate of oil recovery and maintain continued crude oil production. The project is subject to review under the PSD requirements for nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matter (PM). The BACT emission limits for these pollutants are contained in the table below.

The Company proposes to control NO_x and CO emissions by burning natural gas and by good operating and maintenance procedures to achieve proper combustion. However, based on information contained in the technical analysis document, EPA has determined that NO_x emissions from the process heaters greater than 43 million BTU/hr can be reasonably reduced by 60-75 percent through the use of low NO_x burners. The emission limits imposed in the determination of approvability reflect NO_x control to the level that can be achieved by this or similar technology.

Emissions Limitations

Location	Equipment	Pollutant (tons/yr) NO_x	CO	Part.
G.C. #1	*Turbines	2553	476	63
	*Heaters	184	32	19
G.C. #2	*Turbines	4615	861	115
	*Heaters	219	36	21
G.C. #3	*Turbines	2553	476	63
	*Heaters	184	32	19
Well Pads	*Heaters	133	13	8
Central Compressor Plant	*Turbines	646	120	16
	*Heaters	22	2	1
F.S. #1	*Turbines	3049	569	70
	*Heaters			

F.S. #2	*Turbines	3979	742	91
	*Heaters	35	8	5
F.S. #3	*Turbines	3979	742	91
	*Heaters			
Total		22151	4109	582

* Gas Turbines

NO_x	150(14.4/Y)ppm**
CO	109.6 lb $CO/10^6$ scf (fuel)
PM	14 lb $PM/10^6$ scf (fuel)
	5% Opacity Limit

* Process Heaters

$>43 \times 10^6$ BTU/hr	NO_x	0.08 lb $NO_x/10^6$ BTU
$<43 \times 10^6$ BTU/hr	NO_x	0.19 lb $NO_x/10^6$ BTU
	CO	0.018 lb $CO/10^6$ BTU
	PM	0.011 lb $PM/10^6$ BTU
		5% Opacity Limit

** NO_x emissions factor for gas-fired turbines is modified by an efficiency factor (Y) which cannot exceed 1.4 kilojoules/watt x hour (manufacturer's rated heat rate at rated peak load).

Based on 15% oxygen on a dry basis.

A detailed discussion of this determination as well as proposed record keeping requirements are contained in the Technical Analysis document.

The actual installation of turbines and process heaters at each pump station may differ in size and configuration form that stated in the PSD application. Therefore, ARCO/SOHIO was requested to submit additional data examining a range of variations of turbine and heater size to reflect a likely worst case ambient impact scenario. In this way, the worst case air quality impacts could be calculated and assurance could be provided that NAAQS for NO_2 would not be violated taking into account possible changes in equipment specifications.

An ambient air quality analysis demonstrates that NO_x, CO, and PM as limited above, is not expected to cause or contribute to a violation of any National Ambient Air Quality Standard (NAAQS) or a PSD air quality increment. There are

no PSD increments for the NO_x and CO pollutants. The technical analysis document identifies the specific impact of the proposal on the appropriate standards.

RECOMMENDATION

Based upon a review of the application, EPA finds that the proposed modification will not cause violations of any NAAQS or PSD air quality increments. The emission limits required above for NO_x, CO, and PM represent the best available control technology. Therefore, EPA proposes to approve ARCO/SOHIO's request to add 42 gas fired turbines and 31 gas fired heaters to the oil field complex at Prudhoe Bay, Alaska. Comments are requested from interested parties and will be carefully considered when the final determination is made.

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